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A COMPARATIVE STUDY BETWEEN MOZAMBIQUE AND MALAWI SOYBEAN ADOPTION AMONG SMALLHOLDER FARMERS

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ABSTRACT

Demand for soybean in southeast Africa is expected to double between 2010 and 2020 due to the growing population, and increasing demand in the livestock, poultry and aquaculture industry (Walker & Cunguara, 2016). However, the extent to which the current Mozambique and Malawi agricultural development policies support smallholder farmers' participation in soybean farming is not well understood. To examine this, a comparative policy framework was used to examine how the agricultural development objectives stated by both countries were being implemented and the conditions by which they worked through. The study found that the agricultural development policies adopted by both countries were similar in that they were both influenced by CAADP, the UN, IMF, and the World Bank. Despite these similarities, the country specific objectives and productive environments slowed smallholder farmers' participation in soybean farming.

Soybeans (*Glycine max*) have a higher economical, nutritional and ecological, value compared with maize that is predominately grown by smallholder farmers across Sub-Saharan Africa (Giller et al. 2011; Parr 2014; Tinsley 2009; Van Vugt, Franke, and Giller 2016; Zamasiya et al. 2014). As a cash crop, soybeans offer smallholder farmers a diversification opportunity that might improve their household income (Walker and Cunguara 2016). Compared with common beans and maize, soybeans present a feasible alternative to addressing malnutrition among communities dependent on agriculture because they comprise more than 36% protein, 20% oil, 30% carbohydrates, dietary fiber, minerals, and vitamins (Bruns 2016; Klish et al. 1998; Sales et al. 2016). Ecologically, the soybeans' natural ability to fix nitrogen in poor agricultural soils presents a means through which soil fertility and increased crop yields could be addressed for resource poor farmers who are often unable to afford or access synthetic nitrogen fertilizers (Parr 2014; Ronner et al. 2016). Therefore, soybeans present an alternative to promoting economic, social, and ecological development.

A majority (80%) of Mozambicans' and Malawians' are employed in the agriculture sector that contribute 29% and 30%, respectively to the country's GDP (World Bank 2016b). Most of these farmers are engaged in cultivation of maize, tobacco, sugar cane, and rice. Maize is grown primarily for local consumption while

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tobacco, sugar cane, cashew nuts, tea, and coffee are grown for export (Pardey et al. 2016; Parr 2014; Sevilla 2013). Increased food prices and scarcity following the 2008–2009 global recession and weather-related shocks over the last ten years have aggravated malnutrition and poverty among rural populations. Increased flooding and drought have contributed to declining soil fertility and crop failures. To reduce increasing child malnutrition and stunting, NGOs and multilateral organizations such as the World Food Program (WFP) have been importing and distributing a fortified corn-soy blend (Kodish et al. 2017; Stobaugh et al. 2016, 2017). Seeking a long-term solution to declining soil fertility, growing malnutrition rates, and poverty, the International Institute of Tropical Agriculture (IITA), and the Alliance for a Green Revolution in Africa (AGRA) among others have invested in the development of soybeans within the region (AGRA 2013; Ronner et al. 2016; Smart and Hanlon 2014; Walker and Cunguara 2016).

Considering the current soybean development initiatives in southeast Africa, the purpose of this study was to examine to what extent the current agricultural development policies have supported smallholder farmers' participation in soybean farming. To achieve this, the study adopted a comparative policy framework that allowed for a cross-country and process comparisons. A brief background of the two countries and the regional trends in agriculture development as influenced by the Comprehensive Africa Agriculture Development program (CAADP) are described. Next the productive environments and the extent to which both countries' agricultural development policies have complied with CAADP's recommendation for agriculture and rural development are compared and discussed regarding soybean development. Finally, policy implications regarding smallholder farmer participation in soybean production are offered.

The study used various peer-reviewed research papers and dissertations focused on soybean and common bean farming in Malawi and Mozambique over the last ten years. White and gray literature published by TechnoServe, USAID, AGRA, and various government documents were also used due to the limited amount of peer-reviewed research material available. Regional and country level statistics on soybean production and gross domestic production (GDP) from the Food and Agriculture Organization of the United Nations (FAO) database and the World Bank data base were also used.

MOZAMBIQUE AND MALAWI'S SOCIOECONOMIC ENVIRONMENT

Mozambique and Malawi are located in southeast Africa and share national boundaries. Mozambique is eight times larger (801,590 square km) compared with Malawi, which occupies only 95,776 square km (See Figure 1). Malawi is sandwiched by the western part of Mozambique and therefore shares many social, ecological, and geographical characteristics. Many of those living along the Lake

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Malawi, on both sides of the border, belong to the same ethnic groups and therefore share similar cultural practices.



FIGURE 1. MAP OF MOZAMBIQUE AND MALAWI (Source: United Nations 2016).

Like other Sub-Saharan African countries, Mozambique and Malawi have a fast growing and young population (see Table 1). Mozambique's population is estimated at 27.98 million¹ with an estimated population growth rate of 2.45% and expectancy at 53 years. Malawi has an estimated population of 17.22 million people, an estimated population growth rate of 3.32%, and life expectancy of 61 years.

TABLE 1. SOCIOECONOMIC DEVELOPMENT INDICATORS FOR MOZAMBIQUE AND MALAWI.

DEVELOPMENT INDICATOR	MOZAMBIQUE	MALAWI
Economy		
GDP**	16.39	4.26
Population below poverty (2010 est.)*	68.7%	70.9%
Land		
Total land size (square km.)*	801,590	95,776
Arable land for agriculture (ha.)*	5,650,000	3,800,000
Population		
Total estimated population (millions)* ...	27.22	16.7
Population density (per square km)	33.7	178.5
Estimated % rural population*	67.8	83.7
Life expectancy at birth (yrs)*	52.94	60.66
Fertility rate (births/woman)*	5.2	5.6
Total median age (yrs)*	17	16.4

NOTE: *Source: CIA 2016; **Source: The World Bank 2016c.

Mozambique and Malawi have both recorded GDP growth above the regional average (4.2%) over the last ten years. Mozambique's estimated annual GDP growth rate averaged 7% and Malawi 5% (World Bank 2016b). Mozambique's current estimated GDP is at 14.7 billion U.S. Dollars (USD) and Malawi at 4.2 billion USD. Economic development scholars and World Bank researchers attribute Mozambique's economic success to three main factors: increased donor funding and investment in infrastructure development following the 1990 civil war; the World

¹The government of Mozambique provides a lower population estimate of 26,423,623 compared with the World Bank estimates obtained (source: www.ine.gov.mz)

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Bank/ IMF structural adjustment policies (SAPs) that have encouraged development of a free economy; and the growing mining sector (Cunguara and Hanlon 2012; Smart and Hanlon 2014; The World Bank 2016b; Shankland and Gonçalves 2016; Walker and Cunguara, 2016).

Despite the positive economic growth, The World Bank (2016a, 2016b) still estimates over half² the population in Mozambique and Malawi to be living in extreme poverty. Mozambique and Malawi's worsening rural poverty is argued to be an outcome of both historical and structural forces (Cunguara and Hanlon 2012). Historically, Mozambique's extended civil from 1977 to 1992 displaced thousands and affected Malawians living along the Mozambique border, destroying lives, property, infrastructure, and livelihoods. Structurally, both countries' economies have undergone structural adjustments based on the World Bank/ IMF SAPs. The comprehensive restructuring of government and economy led to extensive privatization of social service which in-turn has led to limited access and increased income disparities within rural areas.

How Might Soybeans Contribute Toward Poverty Alleviation and Food Security Concerns in Southeast Africa?

Soybeans are a vital crop that makes up 54% of the global oilseed market (Opperman and Varia 2011). Soybeans are a multipurpose crop and therefore its growing demand is based on its usefulness as a food, feed, and fuel crop. Food security concerns amid the growing global population are particularly highlighted as the main soybean development agenda. Improved genetics and new agricultural land opening are also seen as contributing to soybean development (Sinclair et al. 2014; Smart and Hanlon 2014; Van Vugt et al. 2016; Walker and Cunguara 2016).

History shows soybeans were first cultivated in Malawi in 1910 and Mozambique in 1915 (Shurtleff and Aoyagi 2009). More recently, sustainable agricultural development campaigns along with poverty alleviation and malnutrition concerns within the southeast region have put soybeans in the limelight. A TechnoServe press release previously stated that a four-year soybean development initiative funded by the Gates foundation was expected to benefit at least 37,000 farming households in Mozambique and Zambia (Swanby 2010). Majority of the beneficiaries were expected to be smallholder farmers in Mozambique, which has a less developed soybean value chain compared with Zambia. According to Swanby, (2010), the program was expected to (i) expand soy

²World Bank development indicators (2015) show poverty headcount ratio at national poverty lines declining from 69.4% in 1996, 54.1% in 2007 and 54.7% in 2008. The current GDP growth at 5.9% due to improvements in trade, manufacturing, extractive industries, transport, communication, and electricity production. The same report also shows public debt having risen to 55% and expected to settle at 60%

production by connecting smallholder farmers to buyers, (ii) boost annual incomes of 30,000 smallholder farmers in Mozambique by an average of \$200 a year, (iii) promote investments in soybean storage and processing, and (iv) develop the local feed and livestock industry. Most recently, TechnoServe (2011) reports having achieved 144% of its program income goal given that 32,936 farmers in Mozambique and Zambia have successfully increased their annual incomes by an average of \$287. Therefore, soybeans present a good alternative to economic and social development.

There are currently 22 countries, including Mozambique and Malawi, in Sub-Saharan Africa involved in soybean production. However, Africa lags far behind Argentina and Brazil, which share similar agro-climatic conditions. According to the FAO (2015) database, Nigeria and South Africa are the largest soybean producers in Africa followed by smaller producers such as Uganda, Ghana and Zimbabwe. Irrespective of the number of countries involved in soybean farming, Africa produced less than 1% of the global soybean output in 2016/17. The United States of America (USA) produced the highest (32%) quantity of soybeans followed by Brazil and Argentina (see Figure 2). Despite the low soybean production rates observed in Africa, the current output is expected to double between 2010 and 2020 and continue to increase due to a growing poultry and aquaculture feed industry as well as need for improved human nutrition in the region (Walker and Cunguara 2016).

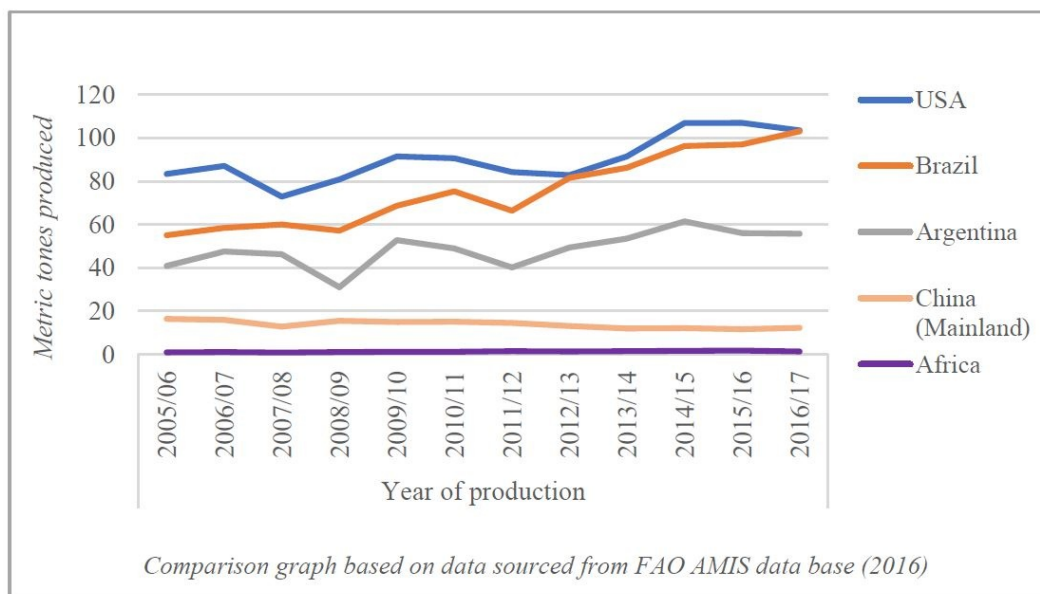


FIGURE 2. MULTI-COUNTRY COMPARISON OF ESTIMATED SOYBEAN PRODUCTION BETWEEN 2005–2017.

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Increased soybean production rates are expected in the southeast region primarily due to the favorable climatic conditions. Mozambique and Malawi share similar agro-climatic characteristics to Latin America's Cerrado tropical savanna corridor that boasts one of the highest soybean production rates in the world. These agro-climatic conditions include latitude, annual precipitation volumes, and solar radiation rates that promote photosynthesis and favorable soybean plant growth (Gasparri et al. 2016; TechnoServe 2011). Like other crops, soybeans are also affected by excessive flooding and droughts. Flooding promotes high soil pH levels and high aluminum content that adversely affect inoculants used to support soybean development (Parr 2014; Van Vugt et al. 2016). Extended droughts lead to insufficient organic soil matter and low phosphorus levels which lead to stunted soybean growth, delayed flowering and delayed shoot growth (Van Vugt et al. 2016). Although most of these environmental conditions can be easily identified and corrected using soil testing services and mineral fertilizers, majority of the smallholder farmers do not have the knowledge nor resources needed.

To promote soybean development the Mozambique government has sponsored the Program of Triangular Cooperation for Agricultural Development of the Tropical Savannahs of Mozambique (ProSavana). ProSavana is a joint soybean farming venture between the Brazilian agriculture research agency³ (EMBRAPA), Cooperation Agencies of Brazil (ABC) and the Japan International Cooperation Agency (JICA). The soybean-farming venture was founded as a technology transfer program to promote soybean development within the country. Malawi, has similarly supported the development of the Soil Food and Health Communities project (SFHC). SFHC is part of a Malawi farmer-to-farmer agro-ecological project (MAFFFA) that uses farmer-to-farmer teaching strategies to promote livelihoods, agro-ecology, nutrition, and local food market development among others (soilandfood.org/projects). SFHC⁴ is a joint project between the Ekwedeni hospital, the University of Malawi, University of Manitoba, the Canadian Food Grains Bank, and Cornell University among others. SFHC was established to help address the high rates of child undernutrition and provide smallholder farmers an alternative to commercial fertilizers that are often too expensive.

Regional Trends and Agriculture Development Policy

Agriculture is central in addressing food security, poverty, employment and economic development in Sub-Saharan Africa (AGRA 2013). Agriculture represents

³Blog publication on development of soybean farming in Mozambique source: <http://agdes.blogspot.com/2012/03/mozambiques-soybean-potential.html>

⁴SFHC is funded by the Canadian government under the Malawi foreign affairs, trade, and development sector.

at least 15% of the continent's GDP and contributes only 10% to the global agriculture output (Jayaram, Riese, and Sanghvi 2010). More than two-thirds of the households in Sub-Saharan Africa depend directly on agriculture for their income and livelihood (USDA Feed the Future Program 2015). Most of these households, about 85%, depend on two or fewer hectares of land for their household consumption and market crops (Jayaram et al. 2010; Jayne et al. 2003).

Despite the important role agriculture plays in Sub-Saharan Africa's development, agriculture productivity is constrained by various biophysical and socioeconomic factors. Declining soil fertility, changing rain patterns, and extended drought seasons are among the most common and frequent biophysical constraints hindering crop production in southeast Africa (Parr 2014; Pauw et al. 2012). Poor farmer health due to HIV/AIDS is particularly noted as slowing agriculture production and contributing to food insecurity within the region (Kerr et al. 2007). Limited access to farm inputs such as improved seed, fertilizers, and resources such as credit, market information and improved agronomic practices, among others also slow agricultural production.

To address agriculture development the African Union⁵ (AU) launched the Comprehensive Africa Agriculture Development Program (CAADP) in 2003. CAADP was founded to launch a 'green revolution' in Africa (AGRA 2013; Wiggins 2014). CAADP is a comprehensive integrated framework for agriculture and rural development and is based within the New Partnership for Africa's Development (NEPAD). NEPAD is the AU's economic development program, which provides member states a similar policy framework to promote greater political, social and economic co-operation and integration. NEPAD recognizes that most of the Sub-Saharan Africa population lives in the rural areas and depends on agriculture. Therefore, CAADP provides an integrated framework through which member states can homogeneously reestablish agricultural growth, address food security, and promote rural development (Pauw, et al. 2012). Member states are required by CAADP to invest at least 10% of their national budget in agriculture. This investment is estimated to lead to a 6% annual GDP growth and improve rural livelihoods (Dorward et al. 2008; Pauw et al. 2012; Wiggins 2014).

Mozambique Agriculture Development Policy

Mozambique agricultural development has been characterized by intensive policy and strategy formulation which rarely comes to fruition (Pauw et al. 2012). Starting in 1999, Mozambique developed its first national Agricultural development program (PROAGRI I) which was followed by PROAGRI II in 2003 and later the

⁵The AU is an intergovernmental organization of African states, established to promote unity, international cooperation and economic development among member states.

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Strategic Plan for Agricultural Development (PEDSA) in 2007. Unlike the previous PROAGRI policies that were never approved nor adopted, PEDSA was approved and adopted in 2007. PEDSA incorporates the goals outlined in CAADP and the IMF poverty reduction strategy highlighted in the country's midterm plan PARP (2011–2014).

According to the government, the Mozambique Poverty Reduction Action Plan (PARP 2011–2014) was a medium-term strategy that focused on combating poverty and promoting economic growth. PARP (2011–2014) was part of the IMF-sponsored poverty reduction strategy papers (PRSPs) and a continuation of the previous poverty reduction strategy policy (PARPA II, 2006–2010), whose primary objectives had been to reduce food insecurity from a level of 54.7% to 42% by 2014. According to this new plan, a 7.7% overall GDP growth between 2011 and 2014 would be achieved. Agriculture alone was predicted to contribute 10.8%, second to the construction sector's 12.4%. To achieve the proposed agricultural development, PARP formulated and adopted the Strategic Plan for Agricultural Development (PEDSA), in 2010. PEDSA incorporated the goals outlined in PARP and CAADP framework that emphasized poverty alleviation through rural development. PEDSA proposed a 7% annual growth rate (a percent higher than the CAADP) and allocated only 9% of the national budget toward agriculture development. PEDSA's goal is to increase agriculture and fisheries output/productivity. Its implementation approach is based on development of agricultural value chains through the following four specific objectives:

1. adoption of improved technologies,
2. increase access to improved inputs based on public-private partnerships (PPP),
3. promote producer associations and cooperatives, and
4. use PPP investment to expand infrastructure in areas with productive potential.

Malawi Agriculture Development Policy

Malawi's agriculture sector has also been constrained by biophysical, economic and political factors. Most agriculture production in Malawi is rain-fed and therefore subject to weather related shocks such as drought and floods. The global crisis of 2008 led to increased food prices and shortages that further exacerbated poverty (Suit and Choudhary 2015). Malawi's government budget allocation toward agriculture nationally has also declined over the years. In 1970 the national budget allocation toward agriculture was 32.15%, by 2000 it had declined to 8.98%. To address growing poverty, IMF-sponsored Farm Input Subsidy Program (FISP) that led to a 15.96% increase in budget allocation in 2009.

Following the IMF poverty reduction strategy papers of 2010, Malawi adopted the Agricultural Sector-Wide Approach (ASWAp). ASWAp is Malawi's strategic

plan for agriculture development and was formulated in response to Malawi's Growth and Development Goals (MGDS) and CAADP. The MGDS comprise the national strategy for achieving the international millennium development goals. ASWAp emphasizes three goals: (i) food security and risk management; (ii) commercial agriculture, agro-processing and market development; and (iii) sustainable agriculture land and water management. Due to its wide scope, the Ministry of Agriculture and Food Security describes ASWAp as an innovative priority investment framework intended to guide both government and development partners (Malawi Government 2012). To achieve the stated goals ASWAp is guided by the following four objectives:

1. increase agriculture productivity by 6% annually,
2. improve food security,
3. diversity food production and improve nutrition at household level, and
4. increase agriculture income for rural people.

DISCUSSION

PEDSA and ASWAp are similar in that they are both based on the MDGs and CAADP framework that recognize food security and rural development as central to poverty alleviation. Both policies also highlight agricultural productivity increases as vital. However, the two policies do differ in their execution strategy. Mozambique's PEDSA is based on economic development. Hence, emphasis is placed on technological transfer, private-public partnerships and producer associations. Malawi's ASWAp objectives are based on social and environmental conservation.

Almost 70% of Mozambicans and 84% Malawians live in rural areas with few roads, limited communication and social infrastructure (CIA 2014). Most of these smallholder farmers lacked access to farm inputs, credit and commodity markets due to poor communication infrastructure, limited access to transportation and banking facilities (Smart and Hanlon 2014). Opperman and Varia's (2011) technical report on the Southern African trade hub soybean value chain noted high transport costs as a major limiting factor for soybean development. According to their assessment, it costs approximately \$150 to transport one metric ton of soybean from the north or central Mozambique. This is almost eight times more expensive compared with the neighboring South Africa. The high transportation costs also make access to seed and other inputs expensive. Therefore, access to improved inputs and markets for agriculture produce remains low.

The high HIV/AIDS rates, malnutrition rates, and lack of adequate health care professionals and social services along the Mozambique-Malawi boarder further complicate agriculture development (Stobaugh et al. 2017). Soybeans high

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economic, nutritional and environmental value present smallholder farmers an alternative crop that could improve their economic and social status. Soybeans have a short growing season (less than four months) which allows poor farmers access to income. The soybeans' ability to serve as a cover crop when rotated with maize also provides poor farmers a cheap alternative to synthetic fertilizers to improve soil fertility and productivity (Tinsley 2009; Sinclair et al. 2014; Gasparri et al. 2016). Therefore, soybeans present smallholder farmers a cover crop that could assist in reducing soil erosion, improving soil fertility as well as diversifying income opportunity and food resources.

Malawi's SFHC and Mozambique's Technoserve success suggests that NGO support rather than government-sponsored programs have led to soybean development among smallholder farmers. According to Kerr et al. (2007), SFHC provides smallholder farmers extensive training and resources that has led to increased participation, production, and market development (Kerr et al. 2007; Parr 2014). Although Mozambique and Malawi have respectively allocated 9% and 15% of their national budgets toward agriculture development according to CAADP's suggestions, the material reviewed suggests that most of the funds and resources are geared toward FISP and other competing programs that do not promote soybean farming among smallholder farmers. Given that soybeans are a relatively new crop and extension services are limited, smallholder farmers with limited resources would be less willing to invest their limited resources in soybeans.

Mozambique and Malawi belong to the same economic block with South Africa. Although South Africa has been Africa's largest soybean producer over the last ten years, Mozambique and Malawi do not share a harmonized seed approval process that might improve access to farm inputs such as improved seeds that would improve their agricultural production. Instead restrictions on genetically modified seeds outside South Africa and uncoordinated seed approval systems discourage seed companies from investing in development of soybean seeds and markets (Opperman and Varia 2011). As a result, seeds and inputs required in soybean farming have remained expensive and unattractive to smallholder farmers faced with uncertainty based on climate and markets.

Malawi boasts a land tenure system that allows private, public and customary land ownership, land. Most recently, the Malawi government implemented a re-allocation of land to poor households largely through the Community Based Rural Land Development Project and introduced land administration and management courses at tertiary level. On the contrary Mozambique's land tenure system has further aggravated land conflict between community members and international

agribusiness companies granted concession rights⁶ by the government. Recognizing access to land as key to soybean development, it could be argued that Malawi smallholder farmers, compared with Mozambique, have been successful in soybean farming since they have ownership rights to their land opposed to the Mozambique farmers who are threatened by growing land conflicts. According to a National Geographic article published in July 2014, increasing demand for food production and expanding agribusiness are threatening Mozambique smallholder farmer livelihoods. This is because agribusiness companies from Brazil, Japan, China, India and the USA have leased large tracts of land, displacing of hundreds of smallholder farmers.

Recognizing Mozambique and Malawi's low agricultural productivity as linked to various social, political, and economic factors that can be addressed through community involvement, agriculture development policy targeting smallholder farmers should be holistic in nature. This could be done by incorporating health care, education, access to credit, storage facilities, and agricultural commodity markets among others. Malawi's emphasis on human development and environmental conservation presents a great starting point and example for Mozambique that shares both biophysical and social cultural attributes.

POLICY IMPLICATIONS FOR SOYBEAN ADOPTION

Poverty reduction strategies in Sub-Saharan Africa are primarily focused on agriculture development. However, the findings of this study are mixed and suggest policy makers and scholars should be more careful when designing poverty alleviation programs in Africa. The study found that agriculture development in Mozambique and Malawi is influenced by socio-cultural, environmental, and economic factors. Soybean farming among smallholder farmers has been influenced mainly by NGO programs that promote soybeans as a conservation and human nutrition crop rather than government-sponsored programs that emphasize entrepreneurial/economic development. Therefore, poverty alleviation programs focused on agricultural commodities should have a greater appreciation of the interconnectedness between livelihoods, resources, and markets (Morse and McNamara 2013).

Many smallholder farmers have limited access to information and resources that might promote soybean farming. Hence, when faced with environmental and economic threats they are less willing to plant new crops such as soybeans, in favor

⁶According to an investor publication released by Quifel Natural Resources (2009), Project Hoyo Hoyo was granted concession rights to 30,000 ha. of land in two locations by the Mozambique government for 50 years with an option to extend to 99 years. QNR also noted land availability, low cost of land and labor, growing demand for soybeans in global market, and fast-growing economies such as that of Mozambique as key driving incentives to the investment.

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of their traditional maize crop (Kassie et al. 2014). Studies on Nigeria and Zimbabwe's smallholder farmers have attributed success in soybean farming to programs that promote community involvement and capacity building (Chianu et al. 2009). Use of agricultural incentives such as seeds, loans, and storage unit construction have been particularly noted as key to soybean development (Chianu et al. 2009). Capacity building programs that train community members how to process soybeans into milk, yogurt, cake and other food products provide a means to improving existing market infrastructure.

Studies on Mozambican and Malawian agriculture patterns have noted legume diversification choices as gendered (Snapp et al. 2010; Kondylis et al. 2015). Women were more likely to select edible food crops such as cowpeas, which could be included in the household diet when diversifying from cash crops. Men on the other hand choose legumes that had more market options. Kondylis et al. (2015) found female farmers tended to diversify from cash crops by adopting crops consumed at the household level. Men on the other hand were more focused on producing for the market. As a result, cropping differences and income differences are seen as women manage smaller plots compared with men and participate in lower decision-making (De Brauw 2015). Soybeans have been promoted both as a food and cash crop. Recognizing that most smallholder farmer households depend on two or fewer acres of land, policy makers interested in promoting soybean farming should take into consideration the fact that soybean development could worsen food security concerns.

CONCLUSION

Agricultural production in Mozambique and Malawi is constrained on different levels. Declining soil fertility, insufficient soil organic matter, and weather-related shocks are specifically noted as encumbering agricultural development. Competing government subsidies such as FISP that promote traditional crops such as maize slow crop diversification and uptake of new crops that do not offer incentives. Although intergovernmental organizations such as AGRA are promoting soybeans among AU member countries that have adopted CAADP, identifying direct outcomes of PEDSA and ASWAp on smallholder farmers' participation on soybean farming is difficult. Smart and Hanlon's (2014) have suggested that Mozambique's soybean development has been driven by the current economic development policy rather than agriculture development policy. This study also found that the Mozambique government support toward ProSavanna instead of smallholder farmers further supports Smart and Hanlon's (2014) argument that soybean is viewed a commercial crop rather than smallholder farmer crop.

Soybean development among smallholder farmers is hampered by limited access to market information, weak links to commodity markets, and low uptake of

improved farm inputs and technologies. Bandiera and Rasul (2006) previously noted that smallholder farmers networks in Mozambique facilitated access to new information and adoption of new agricultural technologies (sunflowers). Recognizing soybeans as a new technology and agriculture extension services as limited due to the current agricultural policy, future studies should examine what types of social networks might facilitate smallholder farmers access to information that might promote soybean farming.

AUTHOR BIOGRAPHY

Fridah M. Mubichi works as a research assistant for two of the 24 Feed the Future Innovation laboratories: the Feed the Future Innovation Lab for Soybean Value Chain Research (SIL) and Feed the Future Innovation Lab for Climate Resilient Beans (CRIB). Her primary research focuses on smallholder farmers' agricultural networks and the role they play in promoting access to agricultural innovations, gender equity, and food security. She also serves as an executive member and communication liaison for the African Rural Sociologist Network (ARSN).

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